

CLAIMS

1. A cold-cathode tube lighting device comprising:

5 a circuit board on which one end of each of a plurality of cold-cathode tubes is mounted, said circuit board including at least two conductor layers;

a plurality of ballast capacitors each having a capacitance between said two conductor layers, at least one of said ballast capacitors being connected to an electrode at the one end of each of said cold-cathode tubes; and

10 a low-impedance power source having an output impedance lower than a combined impedance of said plurality of cold-cathode tubes, said low-impedance power source supplying electric power to said cold-cathode tubes via said ballast capacitors.

15 2. The cold-cathode tube lighting device as claimed in claim 1, wherein said low-impedance power source is mounted on a circuit board different from said circuit board.

3. The cold-cathode tube lighting device as claimed in claim 1, wherein said circuit board is a multi-layer circuit board.

20 4. The cold-cathode tube lighting device as claimed in claim 1, wherein said circuit board is a flexible printed circuit board.

5. The cold-cathode tube lighting device as claimed in claim 1, wherein said conductor layers are conductor films evaporated.

25 6. The cold-cathode tube lighting device as claimed in claim 1, wherein an impedance of each of said ballast capacitors, a combined impedance of a stray capacitance in the periphery of each of

said cold-cathode tubes, and an impedance of each of said cold-cathode tubes during lighting are matched with each other.

7. The cold-cathode tube lighting device as claimed in claim 1,
wherein a series connection circuit of at least two of said ballast
5 capacitors is connected to the electrode at one end of each of said cold-cathode tubes.

8. The cold-cathode tube lighting device as claimed in claim 1,
wherein a surface of said circuit board and a surface of each of
said cold-cathode tubes are disposed so as to be separated from each
10 other by a predetermined distance determined by a temperature difference and an electric potential difference between the surface of said circuit board and the surface of each of said cold-cathode tubes.

9. The cold-cathode tube lighting device as claimed in claim 1,
wherein a surface of said circuit board is disposed so as to be
15 perpendicular to a longitudinal direction of said cold-cathode tubes.

10. The cold-cathode tube lighting device as claimed in claim 9,
wherein a conductor layer closest to said cold-cathode tubes
among said conductor layers is connected to electrodes of said cold-cathode tubes, and a conductor layer farthest from said plurality of
20 cold-cathode tubes among said conductor layers is connected to said low-impedance power source.

11. The cold-cathode tube lighting device as claimed in claim 9,
wherein, when said circuit board includes at least three said
conductor layers, a conductor layer closest to said cold-cathode tubes
25 among said conductor layers and a conductor layer farthest from said

plurality of cold-cathode tubes among said conductor layers are each connected to said low-impedance power source.

12. The cold-cathode tube lighting device as claimed in claim 1,
wherein said low-impedance power source comprises a
5 transformer connected to said ballast capacitors, and said transformer
has an output impedance lower than the combined impedance of said
plurality of cold-cathode tubes.

13. The cold-cathode tube lighting device as claimed in claim 12,
wherein said transformer comprises a core, a primary winding
10 being wound around said core, and a secondary winding being wound
around at least one of the inside and outside of said primary winding.

14. The cold-cathode tube lighting device as claimed in claim 13,
wherein said secondary winding has one configuration of a
sectional winding and a honeycomb winding.

15. The cold-cathode tube lighting device as claimed in claim 1,
wherein said low-impedance power source comprises power
transistors connected to said ballast capacitors.

16. A liquid crystal display comprising:
a plurality of cold-cathode tubes;
20 a liquid crystal panel installed on the front side of said cold-
cathode tubes, said liquid crystal panel shielding light emitted from said
cold-cathode tubes using a predetermined pattern; and
a cold-cathode tube lighting device,
wherein said cold-cathode tube lighting device comprises:
25 a circuit board on which one end of each of said plurality of cold-

cathode tubes is installed, said circuit board including at least two conductor layers;

5 a plurality of ballast capacitors each being a capacitance between said two conductor layers, at least one of said ballast capacitors being connected to an electrode at the one end of each of said cold-cathode tubes; and

10 a low-impedance power source having an output impedance lower than a combined impedance of said plurality of ballast capacitors, said low-impedance power source supplying electric power to said cold-cathode tubes via said ballast capacitors.